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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,926	02/25/2005	Klaus Biester	1600-11400 DAR	9546

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EXAMINER	
ROST, ANDREW J	

ART UNIT	PAPER NUMBER
3751	

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/525,926	BIESTER, KLAUS	
	Examiner	Art Unit	
	Andrew J. Rost	3751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-23 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 25 February 2005 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 9/19/2005.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the Preliminary Amendment filed on 2/25/2005. No claims were cancelled. No claims were added. Claims 1-23 have been amended. Presently, claims 1-23 are pending.

Drawings

2. The drawings are objected to because reference numbers 9, 10, and 12 are indicated by a single arrow with the arrow pointing to an empty space, reference numbers 8, 10, and 11 are indicated by a single arrow with the arrow pointing to an empty space. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the

examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

Page 5, lines 1-2, the phrase "a diagonal angle on the first and/or second spiral-toothed gearwheel in the range of, for example, 50 to 85^6 can be used" is unclear.

Page 5, lines 6, the phrase "transmission ratio lower than 25 and lower than 1" is unclear as to how a transmission ratio can be both lower than 25 and lower than 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 12 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention without undue experimentation. The "transmission ratio of the double helical gear is between i=25 and i<1" is not disclosed, and it is not understood how to set the range

between less than 1 and equal to 25, furthermore, what is the transmission ratio of the double helical gear mean?

7. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 4-5, recites the limitation "exhibits a self-locking helically toothed spur-wheel gear". It is unclear as to the structure being claimed.

Claim 5 recites the limitation "the motor" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitations "the drive shafts" in line 1 and "the motor" in lines 1-2 lack antecedent basis.

Claim 9 recites the limitation "a reduction gear, in particular a so-called harmonic drive" renders the claim indefinite. It is unclear to the examiner as to the exact structure being claimed.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely

exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 11 recites the broad recitation 50 to 90^0, and the claim also recites 65 to 85^0 which is the narrower statement of the range/limitation.

Claim 22 recites the broad recitation 1 to 10, and the claim also recites 1 to 7, and further recites 1 to 4 which is the narrower statement of the range/limitation.

Claim 12 recites the limitation of "the transmission ratio of the double helical gear is between i=25 and i<1" renders the claim indefinite, it is unclear as to how the transmission ratio can be equal to 25 and less than 1.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-7, 11-15, and 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. (6,585,246) in view of Vyskocil (3,998,108).

Regarding claim 1, McCormick et al. disclose a regulating device having a ball spindle drive (ball nut 22 rotates a screw 24) with the ball nut being rotated by motor (14) through a first gear (18) connected to a ball nut assembly and a second gear (16)

connected on the end of the motor drive shaft (17). McCormick et al. do not disclose the gears being spiral-toothed. However, Vyskocil teaches the use of a spiral gear to be old in the art of gear rotation. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to create the first and second gear of McCormick et al. as a spiral gear as taught by Vyskocil because utilizing spiral-toothed gears is a common practice in the field of mechanical engineering to reduce forces applied to the components in a gear system to provide high reliability.

In regards to claim 2, the modified McCormick et al. reference discloses a ball nut (22) that is allowed to rotate but is constrained form axial movement and the ball nut rotates and linearly translates a screw (24) to move an actuator.

In regards to claim 3, the modified McCormick et al. reference discloses a rotating screw and actuating element are arranged along a common axis (shown in Fig. 1).

In regards to claim 4, the modified McCormick et al. reference discloses the ball nut connected to a first gear (18) while the motor is connected to a second gear (16).

In regards to claim 5, the modified McCormick et al. reference discloses an electric motor (col. 2, lines 25-26).

In regards to claims 6 and 7, the modified McCormick et al. reference discloses an additional second gear (34) that connects the first gear and is operated by a second motor (32).

In regards to claim 11, the modified McCormick et al. reference discloses the first and second gears operating with an angle of the gears at 90^0.

In regards to claim 12, the modified McCormick et al. reference discloses a structure having a first and second gear wherein there is no structure preventing the transmission ratio of the gears from being set to be equally to 25 or less than 1 and would have been an obvious matter of design choice to set the transmission ratio to desired valve.

In regards to claim 13, the modified McCormick et al. reference discloses the housing to be of a module design with the housing being flange-mounted (attached at flange extending from lower portion of housing in Fig. 1).

In regards to claim 14, the modified McCormick et al. reference discloses the housing having a first module (upper portion of housing containing motors 14,32 and ball nut 22) and a second module (lower portion of housing having screw 24 and stop collar 46).

In regards to claim 15, the modified McCormick et al. reference discloses an intermediate cover (plate that gears 16,34 are set on) that provide single-ended support of the second gears.

In regards to claim 17, the modified McCormick et al. reference discloses the first gear mounted on the opposite side of the ball nut from the actuating element (shown in Fig. 1).

In regards to claim 18, the modified McCormick et al. reference discloses an intermediate ring (ball nut hub 20) placed between the ball nut and first gear.

In regards to claim 19, the modified McCormick et al. reference discloses bearings (40) to support the ball nut and a retention ring (shown in Fig. 1).

In regards to claim 20, the modified McCormick et al. reference discloses the actuating element (element connected to the end of screw 24 opposite the ball nut) that is supported from rotating.

In regards to claim 21, the modified McCormick et al. reference discloses the second motor (32) is wired in parallel to the first motor (14) and acts as a slave to provide additional torque (col. 2, lines 52-55).

In regards to claim 22, the modified McCormick et al. reference discloses the second gear contains differing amounts of teeth than the first gear producing a change in the gear ratio.

In regards to claim 23, the modified McCormick et al. reference discloses the motors operating together and are coupled to each other through the second and first gears.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Vyskocil as applied to claim 1 above, and further in view of Waber (6,095,487).

McCormick et al. in view of Vyskocil discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not disclose the use having at least two motors arranged on each drive shaft. However, Waber teaches the placement of a second motor on a drive shaft to operate a drive shaft for the purpose of compensating for position errors in the drive units (col. 1, lines 18-21). Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to place a second motor on the drive shafts of the modified McCormick et al. reference as taught by Waber in order to compensate for position errors in the drive units.

11. Claims 9-10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick et al. in view of Waber as applied to claim 1 above, and further in view of Gilges et al. (5,370,011).

In regards to claims 9-10, the modified McCormick et al. reference discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not disclose the use of a reduction gear. However, Gilges et al. teach the use of a reduction gear for the purpose of leading to a high reduction ratio. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to place a reduction gear between the drive shaft and the second gear of the modified McCormick et al. reference as taught by Gilges et al. in order to create a high reduction ration between the motor and the second gear.

In regards to claim 16, the modified McCormick et al. reference discloses an actuator having a motor operating a second gear that rotates a first gear that rotates a ball nut to turn a screw to operate the actuator. The modified McCormick et al. reference does not disclose the placement of a position sensor in the housing. However, Gilges et al. teach the placement of a position sensor through an intermediate cover for the purpose of measuring the position of a control element and transmit a signal to the control system to adjust the position of the control element. Therefore, it

would have been obvious to one of ordinary skill in the art at the time the invention was made to place a sensor through an intermediate cover to measure the position of the rotating member of the modified McCormick et al. reference as taught by Gilges et al. in order to provide feedback and position control for the actuating element and rotating member.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. DE 3607899 discloses a regulating device having a ball spindle drive, two motors, and first and second gear for transmitting the rotational motion from the motor to the ball nut spindle to move an actuating element in a linear direction.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew J. Rost whose telephone number is 571-272-2711. The examiner can normally be reached on 7:30-5 M-Th and 7:30-5 every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine Yu can be reached on 571-272-4835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrew J Rost
Examiner
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6/9/06